Date: Wed, 24 Nov 93 04:30:24 PST
From: Ham-Digital Mailing List and Newsgroup <ham-digital@ucsd.edu>
Errors-To: Ham-Digital-Errors@UCSD.Edu
Reply-To: Ham-Digital@UCSD.Edu
Precedence: Bulk
Subject: Ham-Digital Digest V93 #120
To: Ham-Digital

Ham-Digital Digest Wed, 24 Nov 93 Volume 93 : Issue 120

Today's Topics:

FT-530 glitch
Max BAUD on 6M AM & FM (2 msgs)

Send Replies or notes for publication to: <Ham-Digital@UCSD.Edu>
Send subscription requests to: <Ham-Digital-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Digital Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-digital".

Date: Wed, 24 Nov 93 01:05:17 -0500
From: psinntp!wlnntp.psi.com!usenet@uunet.uu.net
Subject: FT-530 glitch
To: ham-digital@ucsd.edu

Greetings. I have an FT-530 HT and really like it a lot. A friend just
got one and we are going to set up DTMF paging, with the
auto-acknowledgement feature.

I ran into a problem enabling "auto page acknowledgement". When
entering "F/set/9" it displays PA OFF and will not toggle to PA ON.
This does work on my friend's unit.

Any ideas on what might be wrong? My unit is about 6 or 7 months old.
My friend's is new. I am not aware of any other programming option
that would interfere with this, but if anyone knows of one, please let
me know. The only other thing I can think of is that there might be
old firmware in it.

Maybe anyone out there that has one could try it and let me know
whether they can turn this on or not.

Thanks for any help!

73, Seth

Date: 22 Nov 1993 13:53:34 CST
From: ftpbox!mothost!schbbs!maccvm.corp.mot.com!CSLE87@uunet.uu.net
Subject: Max BAUD on 6M AM & FM
To: ham-digital@ucsd.edu

JOE - I have also posted Gary with a correction that is critical here.
Please remeber to include also the restrictions in par 2 which limit
the allowed bandwidth. "No non-phone emission shall exceed the bandwidth
of a communications quality phone emission of the same modulation type."
Thus if using SSB, the max BW is 3 kHz period. The maximum signal BW on
FM would be 16 kHz, both by the FCC's own definitions. Be careful!!
------------------------ Original Article ------------------------
From: jbloom@arrl.org (Jon Bloom, KE3Z)
Newsgroups: rec.radio.amateur.digital.misc
Subject: Re: Max BAUD on 6M AM & FM
Message-ID: <2635@arrl.org>
Date: 22 Nov 93 10:14:13 EST
Organization: American Radio Relay League
Lines: 52

In rec.radio.amateur.digital.misc, gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>In article <CGt9JM.5v9@fms.com> andrews@fms.com (Andrew Sargent N8OFS) writes:
>>
>>I thought this question could easily be answerd by Pt 97, WRONG!
>>
>>I need to know, what is the maximum baud rate (AX.37 packet) using
>>either AM _or_ FM on 6 meters???
>
>Here's what Part 97 has to say about data transmission on 6 meters.
>
>#quote
>
>97.307f(5)
>A RTTY, data or multiplexed emission using a specified digital code
>listed in 97.309(a) of this Part may be transmitted. The symbol rate
>must not exceed 19.6 kilobauds. A RTTY, data or multiplexed emission
>using an unspecified emission using an unspecified digital code under
 ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ strike that; it isn't in the rule
>the limitations listed in 97.309(b) of this Part also may be transmitted.
>The authorized bandwidth is 20 kHz.
>

>#end quote
>
>So you're limited to 19.6 kb *and* a maximum bandwidth of 20 kHz.

Ah, no. What the rule says is that when you are using a specified digital code from 97.309(a), you can send at up to 19.6 kbauds. When you are using "any digital code" you can send within a 20-kHz bandwidth. The first two sentences go together; the last two sentences go together. (This was a lot more obvious before the latest rules rewrite. Old part 97.69 contained each set of code and signaling restrictions together in a common subparagraph.)

Now, I realize that this set of rules doesn't make much sense. To understand why it is the way it is, you have to remember a bit of history of the rules. Before the present rules, you could send only authorized codes,and only via FSK or AFSK. Addition of the authorization to send "any digital code" and using a variety of modulation techniques above HF was sort of grafted onto the existing rules. The result is a bit, well, uneven.

Why hasn't it been changed? Because it hasn't proven to be a problem. When and if it becomes a problem, likely it *will* be changed.

Bottom line: if your packet system on 6 meters is sending only the codes of 97.309(a) (e.g., ASCII), you can run at up to 19.6 kbauds. If you're sending data that doesn't fall within 97.309(a), you have to do so within a 20-kHz bandwidth.

Jon Bloom, KE3Z | jbloom@arrl.org
American Radio Relay League |
225 Main St., Newington CT 06111 |

Date: 22 Nov 1993 14:03:03 CST
From: ftpbox!mothost!schbbs!maccvm.corp.mot.com!CSLE87@uunet.uu.net
Subject: Max BAUD on 6M AM & FM
To: ham-digital@ucsd.edu

The question being answered is not a valid question, since there are additional FCC restrictions on the bandwidth. Please check 97.307 f 2 before going further down the path. The FCC limits you to not more than the bandwidth required for a communications quality voice signal, which on FM is 16 kHz, and since you can't exceed that, the reference to 20 kH is meaningless (and very confusing, too!).
------------------------ Original Article ------------------------
Newsgroups: rec.radio.amateur.digital.misc
From: gary@ke4zv.atl.ga.us (Gary Coffman)

Subject: Re: Max BAUD on 6M AM & FM
Message-ID: <1993Nov22.150859.22728@ke4zv.atl.ga.us>
Reply-To: gary@ke4zv.atl.ga.us (Gary Coffman)
Organization: Destructive Testing Systems
References: <CGt9JM.5v9@fms.com> <1993Nov21.135728.17393@ke4zv.atl.ga.us> <arog.
Date: Mon, 22 Nov 1993 15:08:59 GMT
Lines: 51

In article <arog.753911447@BIX.com> arog@BIX.com (arog on BIX) writes:
>gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>[stuff cut]
>>97.307f(5)
>>A RTTY, data or multiplexed emission using a specified digital code
>>listed in 97.309(a) of this Part may be transmitted. The symbol rate
>>must not exceed 19.6 kilobauds. A RTTY, data or multiplexed emission
>>using an unspecified emission using an unspecified digital code under
>>the limitations listed in 97.309(b) of this Part also may be transmitted.
>>The authorized bandwidth is 20 kHz.

>[more stuff cut to end]

>Taken another way, by the rule.of.thumb that the sum of
>twice the deveation plus twice the highest modulating freq
>is the occupied bandwidth, five kc dev in a twenty kc
>channel allows the highest significant modulation to
>be six kc for FM. For AM, its just twice the modulating
>freq, of course.
>
>Now, how high a bps rate can be fit in six kc ?

That's a tough question. MSK gives us the smallest bandwidth
per baud at 1.2 Hz per baud. Obviously direct MSK is preferred
to modulating an FM voice band radio. However, we can do a few
tricks. First we could use a 5 kb MSK audio signal as our baseband
modulation, but that would run into nasty aliasing problems. Or
we could take an alternate approach of using multiple low baud
carriers in parallel in the voice bandwidth. That's the approach
taken by Telebit in their PEP modems. They can transfer 512 bits
in parallel for each clock tick. However, that requires DSP filtering
to deal with the overlapping carriers.

But the issue is bps, not baud. Since we know we can encode several
bits in one baud by using approaches like QAM, we know we can transfer
more than 5 kbps of data in a 5 kb channel. Depending on the S/N ratio
we have to play with, I'd guess we could get an effective throughput of
at least 38.4 kbps in a voice grade channel since phone modems can do
this using n-way encoding and on-the-fly compression. Whether that's
practical on our radio circuits depends on the amount of training

time we can tolerate in each exchange. Certainly for n-way packet
connections, the training time would be a killer. But for dedicated
duplex links we could probably match phone line modem performance
in a voice bandwidth.

Gary
--
Gary Coffman KE4ZV | Where my job's going, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | I don't know. It might | uunet!rsiatl!ke4zv!gary
534 Shannon Way | wind up in Mexico. | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -NAFTA Blues |

End of Ham-Digital Digest V93 #120
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